

REMARKS

This amendment responds to the Office action of June 27, 2006. Applicants amend claims 1, 14, and 16. Applicants amend paragraph 0016 to add spacing the PTO removed during publication of the original application. Claims 1-29 are presented for examination. Claims 30-35 are withdrawn. Applicants request reexamination and reconsideration of the application.

In section 1 of the Office action, the Examiner acknowledges applicants election without traverse of Group I (claims 1-29).

In sections 2-3 of the Office action, the Examiner rejects claims 1-2, 9-15, and 22-29 under 35 USC 102(b) as being anticipated by US Patent No. 5,459,287 to Swamy (Swamy).

Swamy cannot anticipate amended claim 1 because Swamy fails to describe a via and pad structure including a conductive pad, wherein the solder mask exposes a part of the conductive pad that extends beyond the terminal sides of the component to increase solder formation at the terminal sides.

Our invention relates to a via and pad structure including a conductive pad with a conductive trace connected to a plated via where the conductive pad extends beyond the terminal sides of the component to increase solder formation at the terminal sides and the solder mask reduces solder formation at the terminal end of the component.

As illustrated in our Figure 4A, the solder mask 54 exposes a part of the conductive pads (e.g., the arms 96, 97) that extends beyond terminal sides 75, 76 of the component 53 to facilitate solder formation (e.g., solder joints 41, 51) at the terminal sides 75, 76. The solder mask 50 prevents solder formation at the terminal end to avoid solder wicking into the plated via 55.

Swamy relates to a different structure which facilitates registered connections between a BGA package and a printed circuit board (Abstract). Referring to Figure 3C, Swamy

1 shows the plated sockets 46 aligned with generally ball-shaped lead portions 34. Swamy's solder masking structure 52 (shown with light cross hatch) extends over interstitial portion 48a (shown with heavier cross hatch) and has cutout areas 56 concentric with and slightly larger in diameter than plated sockets 46. Thus, Swamy's solder mask 42 does not expose a part of the interstitial portion 48a to solder. Instead, the solder forms below the generally ball-shaped BGA leads 34 and the plated sockets 46 act as solder dams to prevent solder wicking (see Figure 3C and col. 4, lines 39 - col. 5, lines 44). This is quite different than the invention of amended claim 1.

Amended claim 1 captures these differences reciting a substrate with a via and pad structure for connecting a component to conductive layers of the substrate, comprising:

a substrate;

a plated via connected to the conductive layers;

a solder mask surrounding the plated via; and

a conductive pad with a conductive trace connected to the plated via, wherein the solder mask exposes a part of the conductive pad that extends beyond the terminal sides of the component to increase solder formation at the terminal sides.

Thus, amended claim 1 and its dependent claims 2 and 9-13 are patentable over Swamy.

Independent claim 14 and its dependent claims 15 and 22-29 are allowable over Swamy for reasons similar to those presented in connection with amended claim 1.

In sections 4-5 of the Office action, the Examiner rejects claims 3-8 and 16-21 under 35 USC 103(a) as being unpatentable over Swamy in view of US Patent No. 5,384,433 to Osann Jr. et al (Osann).

Osann fails to make up the basic deficiency of Swamy. Osann fails to provide a solder mask on the conductive pads (see e.g., the lands 50, 52, 54, and 56 in Figure 5). As

1 shown in Figure 5, the exposed lands extend beyond the terminal ends of components
2 46 and 48 will have therefore some solder formation, which, of course, promotes solder
3 wicking into the via holes. Thus, Osann provides no solution much less recognition of
4 the solder wicking problem.

5 In view of the above, claims 3-8 depending from allowable claim 1, and claims 16-21
6 depending from allowable claim 14 are patentable over Swamy and Osann.

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8 Please call to arrange an interview to discuss this response, if you have any question or
9 comment, or if you think it will expedite prosecution.

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12 Respectfully Submitted,

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